```
        /PROCESSOR MANAGEMENT AND INPUT/OUTPUT SYSTEM
                IFDEF KPMIO <XLIST>

        /PAGE 1 -- EXTENDED SYMBOLS

        /EAE
7405    MUY=7405
7407    DVI=7407
7411    NMI=7411
7413    SHL=7413
7501    MQA=7501
7415    ASR=7415
7417    LSR=7417
7421    MQL=7421
7441    SCA=7441
7621    CAM=7621
7403    SCL=7403
7521    XAM=7521

        /MEMORY EXTENSION
6201    CDF=6201
6202    CIF=6202
6214    RDF=6214
6224    RIF=6224
6244    RMF=6244
6234    RIB=6234

        / A/D
6531    ADSF=6531
6532    ADCV=6532
6534    ADRB=6534
6541    ADCC=6541
6542    ADSC=6542
6544    ADIC=6544

        /SCOPE CONTROL
6051    SCER=6051
6052    SCLX=6052
6054    SCIX=6054
6056    SCLIX=6056
6061    SCSE=6061
6062    SCLY=6062
6064    SCIY=6064
6066    SCLIY=6066

6360    ESR=6360        /EXTERNAL SWITCH REGISTER

        /TTY2
6131    K2SF=6131
6132    K2CC=6132
6134    K2RS=6134
6136    K2RB=6136
6141    T2SF=6141
6142    T2CF=6142
6144    T2PC=6144
```

```
6146  T2LS=6146

      /TTY MODE CONTROL
6151  TTYR=6151
6152  TTYC=6152
6153  TTYN=6153

            /INDEX REGISTER
6601  LDX=6601
6605  LDXC=6605
6604  XCLA=6604
6602  SXM=6602
6071  ISX=6071
6072  RDX=6072
6074  RXM=6074
0100  X=100

      /INTERVAL TIMER
6171  LIT=6171
6173  LITC=6173
6174  SIT=6174

      /PRIORITY INTERRUPT DECODE
6561  LDMSK=6561
6562  RDMSK=6562
6564  RDINT=6564
6005  PION=6005

      /SUPERVISOR CALL INTERRUPT
6571  SVC=6571
6573  CLSVC=6573
6572  XSVC=6572
6574  TSVC=6574

      /SYMBOLS FOR HRP HARDWARE
6110  INA=6110
6120  DNS=6120
6310  FRE=6310
6320  SRA=6320
6330  RVI=6330
6370  CLK=6370
6450  OSW=6450
6350  INB=6350
6400  TL1=6400
6410  TL2=6410

      /WR66 INTERFACE
6515  RL66=6515
6514  RH66=6514
6516  WL66=6516
6517  WH66=6517

      /TI INTERFACE
6161  TIR=6161
6162  TIW=6162
```

```
                /SYMBOLS AND DATA STRUCTURES FOR PMIO SYSTEM

        7000    SYSBS=7000          /ADDRESS OF THE START OF THE SYSTEM BASED STORAGE A
REAR
        0600    SBSSIZ=600          /SIZE OF THE SYSTEM BASED STORAGE AREA
        0111    SYSMSK=0111         /INITIAL SYSTEM MASK - DISABLE READER, NON-EXISTENT
                                    /INTERRUPTS, AND CLOCK. CLOCK WILL BE ENABLED WHEN
                                    /THE REAL TIME CLOCK GETS SET BY THE PROGRAM.

                        NOPUNCH
                /PROCESS CONTROL BLOCK
        0000            *0
00000   0000    PCBP1,  0           /POINTER TO NEXT
00001   0000    PCBPR,  0           /PRIORITY
00002   0000    PCBWR,  0           /POINTER TO THE WORKING REGISTER CHAIN
00003   0000    PCBPC,  0           /PC
00004   0000    PCBAC,  0           /AC
00005   0000    PCBMQ,  0           /MQ
00006   0000    PCBX,   0           /X
00007   0000    PCBLXM, 0           /B0=LINK, B1-6=0, B7-9=XMODE, B10-11=0
00010   0000    PCBMF,  0           /B0-5=0, B6-8=IF, B9-11=DF
                PCB,                /LENGTH OF PCB

                /SEMAPHORE
        0000            *0
00000   0000    SEMVAL, 0           /VALUE
00001   0000    SEMQ,   0           /QUEUE

                /WORKING REGISTERS
        0000            *0
00000   0000    WRFP,   0           /FORWARD POINTER
00001   0000    WRALST, 0           /POINTER TO ARGUMENT LIST
00002   0000    WRPC,   0           /SAVED REGISTERS:  PC
00003   0000    WRAC,   0           /                  AC
00004   0000    WRMQ,   0           /                  MQ
00005   0000    WRX,    0           /                  X
00006   0000    WRLXM,  0           /                  LINK, XMODE
00007   0000    WRMF,   0           /                  MEMORY FIELDS
00010   0000    WR0,    0           /TEMPORARY REGISTERS
00011   0000    WR1,    0
00012   0000    WR2,    0
00013   0000    WR3,    0
                WR,                 /SIZE OF WORKING REG. HEADER
                        ENPUNCH
```

```
                /PAGE 0 FIELD 0
        0000            *0
00000   0000    INTRPT, 0
00001   5602            5602    /JMP I .+1, MAKE SURE NO INDEXING OCCURS
00002   0200            INTHDL
00003   0000    PWREGS, 0       /POINTER TO WREG. CHAIN FOR RUNNING PROCESS
00004   0000    CCSW1,  0; 0    /CONTROL CHARACTER SWITCHES FOR TTY1
00005   0000
00006   0000    CCSW2,  0; 0    /CONTROL CHARACTER SWITCHES FOR TTY2
00007   0000

        0020            *20
00020   0000    RUN,    0       /POINTER TO RUNNING PCB
00021   0000    READY,  0       /POINTER TO LIST OF READY PCBS
00022   0000    MCOM,   0       /FOR DECTAPE INTERRUPT HANDLER
00023   0000    IMASK,  0       /SYSTEM INTERRUPT MASK
00024   0000    SVCARG, 0       /ADDRESS FOR SVC ARGUMENT PICKUP

                /VARIABLES FOR BASED STORAGE ROUTINES
00025   0000    AFSC,   0       /POINTER TO A SPECIAL CELL BEING WORKED ON
00026   0000    AFSIZE, 0       /+/- SIZE OF A PARTITION BEING WORKED ON
00027   0000    AFAREA, 0       /ADDRESS OF THE BASED STORAGE AREA BEING WORKED ON
00030   0000    AFCC,   0       /WHEN MOVING DOWN A CHAIN OF PARTITIONS, THIS POINT
S0 S
                                /TO THE CURRENT ONE

00031   0000    DTERR,  0       /DECTAPE STATUS B PUT HERE AFTER TAPE OPERATION

                /VARIABLES FOR SCOPE OUTPUT ROUTINE
00032   0000    HPOS,   0       /HORIZONTAL POSITION OF NEXT CHARACTER TO BE WRITTE
N0 N
00033   0000    VPOS,   0       /VERTICAL POSITION
00034   5711    SCWAIT, SCWPF   /POINTER TO SCOPE WAIT ROUTINE

                /LF COUNTERS FOR THE TTYS
00035   0000    LFCT1,  0
00036   0000    LFCT2,  0

00037   0000    SCFLG,  0       /=1 => SCOPE IN USE
00040   0000    MQD,    0       /DISPLAY IN MQ WHILE WAITING.
```

```
                /ENTRY INTO THE INTERRUPT HANDLER.  THIS PAGE CONTAINS THE ENTRY INT
O  O
                /AND EXIT FROM THE DECTAPE HANDLER.

      0200              *200
00200 6771  INTHDL,     DTSF    /IS IT DECTAPE
00201 5226              JMP INTL1
00202 3223              DCA TSVAC       /YES, SAVE AC, L, XM
00203 6074              RXM
00204 7010              RAR
00205 3224              DCA TSVLXM
00206 6602              SXM             /SET XMODE TO 0
00207 5422              JMP I MCOM      /ENTER DECTAPE HANDLER

00210 1000  DTRET,      TAD 0           /RETURN FROM DECTAPE HANDLER
00211 3225              DCA TSVPC       /CAN'T JMP I 0 WITHOUT KNOWING XMODE
00212 1224              TAD TSVLXM      /RESTORE L, XM
00213 7104              CLL RAL
00214 1377              TAD (SXM
00215 3216              DCA .+1
00216 7000              NOP
00217 1223              TAD TSVAC       /RESTORE AC
00220 6244              RMF             /RESTORE IF AND DF
00221 6005              PION
00222 5625              JMP I TSVPC
00223 0000  TSVAC,      0
00224 0000  TSVLXM,     0
00225 0000  TSVPC,      0
```

```
                /NON - DECTAPE INTERRUPT HANDLER
00226  3776'    INTL1,  DCA ISVAC       /SAVE AC, MEMORY FIELDS, PC
00227  6234            RIB
00230  3267            DCA ISVMF
00231  1000            TAD INTRPT
00232  3775'           DCA ISVPC
00233  6074            RXM
00234  7010            RAR
00235  3266            DCA ISVLXM
                /READ INTERRUPT ADDRESS. ADDRESS MUST BE READ
                /UNTIL TWO CONSECUTIVE READINGS MATCH
00236  6564    INTL2,  RDINT
00237  3263            DCA IHADDR
00240  6564            RDINT
00241  7041            CIA
00242  1263            TAD IHADDR
00243  7640            SZA CLA
00244  5236            JMP INTL2
00245  7240            STA             /MASK OFF ALL INTERRUPTS
00246  6561            LDMSK
00247  6005            PION            /TURN THE INTERRUPT SYSTEM BACK ON
00250  6072            RDX
00251  3265            DCA ISVX
00252  7501            MQA
00253  3264            DCA ISVMQ
00254  6602            SXM 0           /SET XMODE TO 0

                /ENTER INTERRUPT HANDLER.
00255  1263            TAD IHADDR      /TWO READINGS MATCH, LOOK UP HANDLER ADDRES
S2 S
00256  1374            TAD (IHTAB      /IN TABLE (IHTAB)
00257  3263            DCA IHADDR
00260  1663            TAD I IHADDR
00261  3263            DCA IHADDR
00262  5663            JMP I IHADDR
00263  0000    IHADDR, 0
       0257    ISVPCB=.-PCBMQ
00264  0000    ISVMQ,  0
00265  0000    ISVX,   0
00266  0000    ISVLXM, 0
00267  0000    ISVMF,  0

                /UPDATE PCB. ENTER WITH X->PCB, MODE 6
00270  0000    UPPCB,  0
00271  1775'           TAD ISVPC
00272  3103            DCA X+PCBPC
00273  1776'           TAD ISVAC
00274  3104            DCA X+PCBAC
00275  1264            TAD ISVMQ
00276  3105            DCA X+PCBMQ
00277  1266            TAD ISVLXM
00300  3107            DCA X+PCBLXM
00301  1265            TAD ISVX
00302  3106            DCA X+PCBX
00303  1267            TAD ISVMF
00304  3110            DCA X+PCBMF
```

```
00305  5670          JMP I UPPCB
```

```
                /INTERRUPT HANDLER TABLE
00306  0400  IHTAB,  TC       /0  NI INTERRUPT EXISTS
00307  5700          DTAHDL   /1  DECTAPE  (SOFTWARE)
00310  0755          ITMHDL   /2  INTERVAL TIMER
00311  1000          CLKHDL   /3  CLOCK
00312  0400          TC       /4
00313  0400          TC       /5
00314  0400          TC       /6
00315  0400          TC       /7
00316  0746          ITGHDL   /8  INTEGRATOR
00317  0614          TP2HDL   /9  TTY2 PRINTER
00320  0606          TP1HDL   /10 TTY1 PRINTER
00321  0600          PTPHDL   /11 PUNCH
00322  0637          KB1HDL   /12 TTY1 KEYBOARD
00323  0236          INTL2    /13 READER (NO HANDLER SUPPLIED FOR NOW)
00324  0660          KB2HDL   /14 TTY2 KEYBOARD
00325  0326          SVCHDL   /15 SUPERVISOR CALL
```

```
                /SUPERVISOR CALL HANDLER. SET UP SVCARG, SVCDF, ENTER APPROPRIATE
                /ROUTINE. HANDLE SKIP/NON-SKIP RETURNS FROM SVC ROUTINES.
00326  1775'  SVCHDL,  TAD ISVPC        /UPDATE ISVPC, GET ADDRESS OF ARGUMENTS
00327  6673            LDX SXM 70
00330  1373            TAD (2
00331  3775'           DCA ISVPC
00332  1267            TAD ISVMF        /CREATE A CDF TO THE IF OF THE SVC CALL, PU
T3 T
00333  0372            AND (70          /IT IN THE SVCDF ROUTINE
00334  1371            TAD (CDF
00335  3355            DCA SVCDF+1
00336  4354            JMS SVCDF
00337  1100            TAD X            /PICK UP SVC ARGS
00340  3353            DCA SVCAD
00341  1101            TAD X+1
00342  3024            DCA SVCARG
00343  6201            CDF              /EXECUTE SVC ROUTINE
00344  6602            SXM
00345  4753            JMS I SVCAD
00346  5351            JMP .+3          /HANDLE SKIP RETURN
00347  6201            CDF
00350  2775'           ISZ ISVPC
00351  6573            CLSVC            /CLEAR SVC FLAG
00352  5770'           JMP TC           /ENTER TRAFFIC CONTROLLER
00353  0000  SVCAD,    0

00354  0000  SVCDF,    0
00355  7000            NOP              /CDF PUT HERE
00356  5754            JMP I SVCDF
```

```
00370  0400
00371  6201
00372  0070
00373  0002
00374  0306
00375  0461
00376  0462
00377  6602
       0400            *400
                /TRAFFIC CONTROLLER.  ON ENTRY, AC=0, XM=0,4,5,6,OR 7.  IF RUNNING
                /PROCESS (IF ANY) HAS GREATER OR EQUAL PRIORITY THAN FIRST READY
                /PROCESS, CONTINUE IT.  IF NOT, UPDATE RUNNING PCB AND SWITCH
                /PROCESSES, RESETTING THE INTERVAL TIMER.
00400  1021  TC,       TAD READY       /GET PRIOTITY OF FIRST READY PROCESS
00401  7450            SNA             /IN CASE NONE READY
00402  5210            JMP .+6
00403  6667            LDXC SXM 60
00404  1101            TAD X+PCBPR
00405  7415            ASR; 2          /MASK OFF NTQ BITS
00406  0002
00407  7041            CIA
00410  3260            DCA RDYPR
00411  1020            TAD RUN         /NOW GET RUNNING PROCESS PRIORITY
00412  7450            SNA             /IF NO RUNNING PCB, ENTER TCSW2
00413  5266            JMP TCSW2
00414  6605            LDXC
00415  1101            TAD X+PCBPR
00416  7415            ASR; 2
00417  0002
00420  1260            TAD RDYPR       /COMPARE PRIORITIES
00421  7710            SPA CLA
00422  5263            JMP TCSW

                /CONTINUE RUNNING PROCESS
00423  1377            TAD (ISVPCB
00424  6667            LDXC SXM 60
00425  1105  TCSTRT,  TAD X+PCBMQ     /RESTORE MQ
00426  7421            MQL
00427  1110            TAD X+PCBMF     /RESTORE DF
00430  7006            RTL; RAL
00431  7004
00432  0376            AND (70
00433  1375            TAD (CDF
00434  3235            DCA .+1
00435  7000            NOP
00436  1110            TAD X+PCBMF     /RESTORE IF
00437  0376            AND (70
00440  1374            TAD (CIF
00441  3242            DCA .+1
00442  7000            NOP
00443  1107            TAD X+PCBLXM    /RESTORE LINK, SET UP LDXC SXM INSTRUCTION
00444  7104            CLL RAL
00445  1373            TAD (LDXC SXM
00446  3254            DCA .+6
00447  1023            TAD IMASK       /RESTORE INTERRUPT MASK
```

```
00450  6002           IOF
00451  6561           LDMSK
00452  7200           CLA
00453  1106           TAD X+PCBX       /RESTORE X, XMODE
00454  7000           NOP
00455  1262           TAD ISVAC        /RESTORE AC
00456  6005           PION
00457  5661           JMP I ISVPC
00460  0000  RDYPR,    0
00461  0000  ISVPC,    0               /THESE MUST BE ON THIS PAGE BECAUSE WE DON'
T4 I
00462  0000  ISVAC,    0               /KNOW THE XMODE WHEN THEY ARE REFERENCED AB
OVE.

                /SWITCH PROCESSES
00463  4772'  TCSW,    JMS UPPCB       /FIRST, UPDATE RUNNING PCB.
00464  4771'           JMS CHPCB       /PUT PCB ON READY LIST
00465  0021            READY
00466  1021   TCSW2,   TAD READY       /RUN FIRST PROCESS ON READY LIST
00467  7450            SNA
00470  5314            JMP NOWORK      /NOTHING TO BE DONE, WAIT
00471  6601            LDX             /PUT POINTER TO PCB TO BE RUN IN X AND IN R
UN U
00472  3020            DCA RUN
00473  1100            TAD X+PCBP1'    /UPDATE READY
00474  3021            DCA READY
00475  1103            TAD X+PCBPC     /SET UP FOR ENTERING TCSTRT
00476  3261            DCA ISVPC
00477  1104            TAD X+PCBAC
00500  3262            DCA ISVAC
00501  1102            TAD X+PCBWR     /SET PWREGS
00502  3003            DCA PWREGS
00503  1101            TAD X+PCBPR
00504  0370            AND (7          /RESET INTERVAL TIMER. GET NUMBER OF TIME Q
UANTUMS
00505  7001            IAC
00506  7425            MQL MUY
00507  0063   TQ,      63              /SYSTEM TIME QUANTUM, APPROX. 50MS.
00510  7330            STL CLA RAR     /ENABLE TIMER INTERRUPT
00511  7501            MQA
00512  6173            LITC
00513  5225            JMP TCSTRT

                /NOTHING TO DO, WAIT WITH INTERRUPTS ON (EXCEPT INTERVAL TIMER)
00514  6173   NOWORK,  LITC
00515  1023            TAD IMASK
00516  6561            LDMSK
00517  7200            CLA
00520  1040            TAD MOD
00521  7421            MQL
                /COMPUTE WAIT PERCENTAGE
00522  6002   WAITL,   IOF            /INCREMENT WTPCT EVERY 10 MS.
00523  2333            ISZ WTPCTL
00524  5330            JMP .+4
00525  2332            ISZ WTPCT
00526  1367            TAD (-2127
00527  3333            DCA WTPCTL
00530  6005            PION
00531  5322            JMP WAITL
```

```
00532  00000  WTPCT,  0
00533  00000  WTPCTL,  0
```

```
00567  5651
00570  0007
00571  1100
00572  0270
00573  6607
00574  6202
00575  6201
00576  0070
00577  0257
       0600            *600
                /HANDLERS FOR CHARACTER OUTPUT DEVICES

                /PUNCH
00600  6022     PTPHDL, PCF             /CLEAR FLAG
00601  4222             JMS CHOINT
00602  2327             PTPSEM
00603  6026             PLS             /PUNCH NEXT CHAR IF NECESSARY
00604  7200             CLA
00605  5777'            JMP TC

                /TTY1 PRINTER
00606  6042     TP1HDL, TCF             /CLEAR FLAG
00607  4222             JMS CHOINT
00610  2336             TP1SEM
00611  6046             TLS
00612  7200             CLA
00613  5777'            JMP TC

                /TTY2 PRINTER
00614  6142     TP2HDL, T2CF
00615  4222             JMS CHOINT
00616  2345             TP2SEM
00617  6146             T2LS
00620  7200             CLA
00621  5777'            JMP TC

                /INTERRUPT HANDLER FOR CHARACTER OUTPUT.
00622  0000     CHOINT, 0
00623  1622             TAD I CHOINT    /GET POINTER TO SEMAPHORE
00624  2222             ISZ CHOINT
00625  3024             DCA SVCARG      /SET UP SVCARG FOR CALL TO V
00626  4776'            JMS V           / V ON SEMAPHORE
00627  7105             CLL IAC RAL     /BSC FOLLOWS SEMAPHORE, GET BSC ADDRESS AND

00630  1024             TAD SVCARG      /PUT IN X
00631  6667             LDXC SXM 60
00632  2104             ISZ X+4         /INCREMENT INTEGER
00633  7410             SKP
00634  5777'            JMP TC          /=0 => DONE, ENTER TC
00635  4334             JMS SRRING      /<>0, READ NEXT CHAR FROM BUFFER, RETURN TO

00636  5622             JMP I CHOINT    /OUTPUT IT
```

```
                /HANDLERS FOR CHARACTER INPUT DEVICES

                /TTY1 KEYBOARD
00637  1375  KB1HDL,  TAD (KB1BSC      /SET UP FOR TTY1
00640  6663           LDX SXM 60
00641  1374           TAD (5           /SEMAPHORE FOLLOWS BSC
00642  3024           DCA SVCARG
00643  6032           KCC
00644  1373           TAD (200
00645  6034           KRS
00646  4271           JMS CCHDL        /HANDLE CCSW
00647  0004           CCSW1
00650  2104  CHIINT,  ISZ X+4          /INCREMENT INTEGER
00651  5255           JMP .+4
00652  7240           STA              /=0, SET TO -1 AND IGNORE CHARACTER
00653  3104           DCA X+4
00654  5777'          JMP TC
00655  4322           JMS SWRING       /<>0, WRITE CHARACTER INTO BUFFER, V ON
00656  4776'          JMS V            /SEMAPHORE
00657  5777'          JMP TC

                /TTY2 KEYBOARD
00660  1372  KB2HDL,  TAD (KB2BSC      /SET UP FOR TTY2
00661  6663           LDX SXM 60
00662  1374           TAD (5
00663  3024           DCA SVCARG
00664  6132           K2CC
00665  1373           TAD (200
00666  6134           K2RS
00667  4271           JMS CCHDL        /HANDLE CCSW
00670  0006           CCSW2

                /HANDLE CONTROL CHARACTER SWITCHES
00671  0000  CCHDL,   0
00672  3321           DCA CCHSV        /SAVE CHARACTER
00673  1321           TAD CCHSV        /IS IT BETWEEN ^C AND ^Z?
00674  1371           TAD (-232
00675  7540           SMA SZA          /<=232?
00676  5316           JMP CCHEX
00677  1370           TAD (232-203
00700  7510           SPA              />=203?
00701  5316           JMP CCHEX
00702  7427           MQL DVI; 14      /YES, DECIDE WHICH BIT TO SET
00703  0014
00704  3312           DCA .+6          /NUMBER OF PLACES TO SHIFT
00705  7521           MQL MQA          /GET ADDRESS OF SWITCH WORD AND ZERO MQ
00706  1671           TAD I CCHDL
00707  3271           DCA CCHDL        /SAVE ADDRESS IN CCHDL
00710  7001           IAC
00711  7417           LSR; 0
00712  0000
00713  1671           TAD I CCHDL      /SET APPROPRIATE BIT
00714  7501           MQA
00715  3671           DCA I CCHDL
00716  7200  CCHEX,   CLA              /EXIT
```

```
00717  1321          TAD CCHSV
00720  5250          JMP CHIINT
00721  0000  CCHSV,  0
```

```
                /WRITE CHAR IN AC INTO RING BUFFER. ON ENTRY, XM=6, X->BSC
                /WRITE, THEN UPDATE BSC.
00722  0000     SWRING, 0
00723  3503             DCA I X+3        /PUT CHARACTER IN THE BUFFER
00724  2103             ISZ X+3          /UPDATE WRITE ADDRESS
00725  1103             TAD X+3          /IF END OF BUFFER, RESET WRITE ADDRESS
00726  1101             TAD X+1
00727  7640             SZA CLA
00730  5722             JMP I SWRING
00731  1100             TAD X
00732  3103             DCA X+3
00733  5722             JMP I SWRING

                /READ CHARACTER INTO AC FROM RING BUFFER. ON ENTRY, XM=6, X->BSC.
                /UPDATE, THEN READ
00734  0000     SRRING, 0
00735  2102             ISZ X+2 /UPDATE READ ADDRESS
00736  1102             TAD X+2          /IF END OF THE BUFFER, RESET READ ADDRESS
00737  1101             TAD X+1
00740  7640             SZA CLA
00741  5344             JMP .+3
00742  1100             TAD X
00743  3102             DCA X+2
00744  1502             TAD I X+2        /FETCH CHARACTER
00745  5734             JMP I SRRING
```

```
                /INTEGRATOR SERVICE ROUTINE. V ON ITGSEM
00746  6332     ITGHDL, RVI 2   /CLEAR FLAG
00747  1367             TAD (ITGSEM     /V ON SEMAPHORE
00750  3024             DCA SVCARG
00751  4776'            JMS V
00752  5777'            JMP TC
00753  0000     ITGSEM, 0; 0
00754  0000

                /TIMER SERVICE ROUTINE
00755  1020     ITMHDL, TAD RUN         /CLEAR I/0 BIT IN RUNNING PCB PRIORITY AND
00756  6667             LDXC SXM 60     /SWITCH PROCESSES
00757  1101             TAD X+PCBPR
00760  0366             AND (6777
00761  3101             DCA X+PCBPR
00762  5765'            JMP TCSW
```

```
00765  0463
00766  6777
00767  0753
00770  0027
00771  7546
00772  2363
00773  0200
00774  0005
00775  2354
00776  1226
00777  0400
       1000            *1000
                /CLOCK SERVICE ROUTINE.  UPDATE REAL TIME CLOCK AND HANDLE THE FOUR
                /TIMERS.
01000  6372  CLKHDL,  CLK 2              /CLEAR FLAG
01001  4777'          JMS DEBUG
01002  2254           ISZ CLK8           /UPDATE CLOCK
01003  5226           JMP CLKL1
01004  1776'          TAD WTPCT          /DISPLAY AND RESET WAIT PERCENTAGE.
01005  7427           MQL DVI; 12
01006  0012
01007  7521           MQL MQA
01010  7106           CLL RTL; RTL
01011  7006
01012  7501           MQA
01013  6452           OSW 2
01014  7200           CLA
01015  3776'          DCA WTPCT
01016  1375           TAD (-2127
01017  3774'          DCA WTPCTL
01020  1373           TAD (-10
01021  3254           DCA CLK8
01022  2255           ISZ CLKL
01023  5226           JMP CLKL1
01024  2256           ISZ CLKH
01025  7000           NOP
01026  1372  CLKL1,   TAD (-4            /LOOP 4 TIMES TO DO EACH TIMER
01027  3257           DCA CLKCNT         /INITIALIZE COUNT
01030  1371           TAD (ITM1          /POINTER TO FIRST TIMER
01031  6563  CLKL2,   LDX SXM 60
01032  3024           DCA SVCARG
01033  1102           TAD X+2            /IF MOD 8 COUNTER OF TIMER IS ZERO, TIMER
01034  7650           SNA CLA            /IS NOT IN USE, IGNORE IT
01035  5246           JMP CLKL3
01036  2102           ISZ X+2            /TIMER IN USE, UPDATE COUNT
01037  5246           JMP CLKL3
01040  1373           TAD (-10           /RESET MOD 8 COUNTER
01041  3102           DCA X+2
01042  2103           ISZ X+3
01043  5246           JMP CLKL3
01044  3102           DCA X+2            /TIME UP, CLEAR MOD 8 COUNTER, V ON SEMAPHO
RE R
01045  4770'          JMS V
01046  7107  CLKL3,   CLL IAC RTL        /DO NEXT TIMER
01047  1024           TAD SVCARG
01050  2257           ISZ CLKCNT
```

```
01051  5231           JMP CLKL2
01052  7200           CLA
01053  5767'          JMP TC
01054  7770  CLK8,    -10
01055  0000  CLKL,    0
01056  0000  CLKH,    0
01057  0000  CLKCNT,  0
01060  0000  ITM1,    ZBLOCK 4
01064  0000  ITM2,    ZBLOCK 4
01070  0000  ITM3,    ZBLOCK 4
01074  0000  ITM4,    ZBLOCK 4
```

```
                /CHAIN PCB POINTED TO BY X ON TO LIST. ADDRESS OF POINTER TO LIST
                /FOLLOWS JMS CHPCB. ON ENTRY, AC=HQ(I.E. 0 OR 10)
01100  0000  CHPCB,   0
01101  1101           TAD X+PCBPR      /GET PRIORITY
01102  0373           AND (7770        /MASK NTQ BITS
01103  7041           CIA
01104  3342           DCA CHPR         /SAVE IT
01105  6072           RDX              /SAVE POINTER TO PCB TO BE CHAINED
01106  3343           DCA CHPTR
01107  1700           TAD I CHPCB      /GET ADDRESS OF LIST POINTER
01110  2300           ISZ CHPCB
01111  3344           DCA CHPL1        /SET UP FOR CHAIN OPERATIONS
01112  1744           TAD I CHPL1      /GET POINTER TO FIRST PCB ON CHAIN
01113  6601  CHPL2,   LDX
01114  7650           SNA CLA          /IS IT NULL?
01115  5327           JMP CHPL3
01116  1101           TAD X+PCBPR      /NO, TEST PRIORITY , CONTINUE DOWN CHAIN
01117  0373           AND (7770        /UNTIL A PCB IS FOUND WHOSE PRIORITY IS
01120  1342           TAD CHPR         /LESS THAN THE PRIORITY OF THE PCB BEING CH
AINED
01121  7710           SPA CLA
01122  5327           JMP CHPL3
01123  6072           RDX              /NOT FOUND YET, ADVANCE
01124  3344           DCA CHPL1        /SAVE OLDX
01125  1100           TAD X+PCBP1      /GET NEW X
01126  5313           JMP CHPL2
01127  6072  CHPL3,   RDX              /INSERT PCB
01130  3345           DCA CHPL4
01131  1344           TAD CHPL1        /GET OLDX
01132  6605           LDXC
01133  1343           TAD CHPTR
01134  3100           DCA X+PCBP1
01135  1343           TAD CHPTR
01136  6605           LDXC
01137  1345           TAD CHPL4
01140  3100           DCA X+PCBP1
01141  5700           JMP I CHPCB
01142  0000  CHPR,     0
01143  0000  CHPTR,    0
01144  0000  CHPL1,    0
01145  0000  CHPL4,    0
```

```
01167  0400
01170  1226
01171  1060
01172  7774
01173  7770
01174  0533
01175  5651
01176  0532
01177  6200
       1200            *1200
                /P PRIMITIVE.
                /SVCARG -> SEMAPHORE.  ALL SEMAPHORES ARE IN FIELD 0.
01200  0000  P,       0
01201  1024            TAD SVCARG          /ADDRESS OF SEMAPHORE -> X.
01202  6667            LDXC SXM 60
01203  7240            STA                 /DECREMENT VALUE
01204  1100            TAD X+SEMVAL
01205  3100            DCA X+SEMVAL
01206  1100            TAD X+SEMVAL        /IS VALUE <0?
01207  7700            SMA CLA
01210  5600            JMP I P             /NO, RETURN
01211  6073            ISX RIX             /YES, PUT PCB ON QUEUE
01212  3223            DCA PSEMQ
01213  1020            TAD RUN
01214  6667            LDXC SXM 60
01215  1101            TAD X+PCBPR         /SET I/O BIT, IN PRIORITY
01216  0377            AND (6777
01217  1376            TAD (1000
01220  3101            DCA X+PCBPR
01221  4775'           JMS UPPCB           /UPDATE RUNNING PCB
01222  4774'           JMS CHPCB           /PUT PCB ON SEMAPHORE QUEUE
01223  0000  PSEMQ,    0
01224  3020            DCA RUN             /SET RUN TO NULL
01225  5600            JMP I P
```

```
                /V PRIMITIVE
                /SCVARG -> SEMAPHORE
01226  0000  V,       0
01227  1024           TAD SVCARG       /POINTER TO SEMAPHORE --> X
01230  6667           LDXC SXM 60
01231  2100           ISZ X+SEMVAL     /INCREMENT VALUE
01232  7410           SKP
01233  5237           JMP VL1          /VALUE  IS ZERO, WAKE UP
01234  1100           TAD X+SEMVAL
01235  7740           SMA SZA CLA      /TEST SEMVAL
01236  5626           JMP I V
01237  6073  VL1,     ISX RDX          /WAKE UP PROCESS
01240  3251           DCA VL2          /SAVE POINTER TO SEMQ
01241  1100           TAD X            /PUT POINTER TO FIRST PCB ON QUEUE IN X
01242  6605           LDXC
01243  1100           TAD X+PCBP1
01244  3651           DCA I VL2
01245  1373           TAD (10          /HQ=1
01246  4774'          JMS CHPCB        /PUT PCB ON READY LIST
01247  0021           READY
01250  5626           JMP I V
01251  0000  VL2,     0
```

```
                /CREATE PROCESS. SKIP IF OK.
                /SVCARG -> STARTING ADDRESS
                /          STARTINE MEMORY FIELDS
                /          PRIORITY
01252  0000  FORK,    0
01253  1024           TAD SVCARG       /GET ARGUMENTS:
01254  6677           LDXC SXM 70
01255  4772'          JMS SVCDF
01256  1100           TAD X            /GET STARTING ADDRESS
01257  3320           DCA FRKPC
01260  1101           TAD X+1          /MEMORY FIELDS
01261  3321           DCA FRKMF
01262  1102           TAD X+2          /PRIORITY
01263  3322           DCA FRKPR
01264  6201           CDF
01265  1264           TAD .-1          /ALLOCATE NEW PSC
01266  3771'          DCA SVCDF+1
01267  1370           TAD (FRKAL
01270  3024           DCA SVCARG
01271  4767'          JMS ALOC
01272  5652           JMP I FORK       /NON-SKIP RETURN
01273  1325           TAD FRKAL+2      /PUT POINTER TO NEW PSC IN X AND IN FRKSEM
01274  6663           LDX SXM 60
01275  3330           DCA FRKSEM+SEMQ
01276  3100           DCA X+PCBP1      /LOAD UP NEW PCB
01277  1322           TAD FRKPR        /PRIORITY
01300  3101           DCA X+PCBPR
01301  1320           TAD FRKPC        /PC
01302  3103           DCA X+PCBPC
01303  1766'          TAD ISVAC        /SAME AC
01304  3104           DCA X+PCBAC
01305  3107           DCA X+PCBLXM     /ZERO LINK, XM
01306  1321           TAD FRKMF
01307  3110           DCA X+PCBMF
01310  3102           DCA X+PCBWR      /ZERO WREG. CHAIN
01311  7240           STA              /SET UP VALUE OF FRKSEM
01312  3327           DCA FRKSEM+SEMVAL
01313  1365           TAD (FRKSEM      /V ON SEMAPHORE TO START PROCESS
01314  3024           DCA SVCARG
01315  4226           JMS V
01316  2252           ISZ FORK
01317  5652           JMP I FORK
01320  0000  FRKPC,   0
01321  0000  FRKMF,   0
01322  0000  FRKPR,   0
01323  6201  FRKAL,   CDF              /ARGUMENT LIST FOR CALL TO ALOC
01324  7000           SYSBS
01325  0000           0
01326  0011           PCB
01327  0000  FRKSEM,  0; 0
01330  0000
```

```
                /TERMINATE PROCESS
01331  0000  QUIT,    0
01332  1020           TAD RUN          /FREE CURRENT PCB
01333  3345           DCA QUFR+2
01334  1364           TAD (QUFR
01335  3024           DCA SVCARG
01336  1343           TAD QUFR
01337  3771'          DCA SVCDF+1
01340  4763'          JMS FREE
01341  3020           DCA RUN          /CLEAR RUN
01342  5731           JMP I QUIT
01343  6201  QUFR,    CDF              /ARGUMENT LIST FOR CALL TO FREE
01344  7000           SYSBS
01345  0000           0
```